

revealed signs of left ventricular failure, with a normal blood pressure and heart rate. A transthoracic echocardiogram (TTE) revealed dilated left ventricle with severe global hypokinesis and a left ventricular ejection fraction (LVEF) of 15%. A CTPA performed to exclude pulmonary embolism revealed an incidental right sided adrenal lesion measuring 3.9 X 3.4 X 3.7 cm. Subsequently a dedicated abdominal CT confirmed the adrenal lesion. Biochemistry revealed elevated 24 hour urine catecholamines and metanephrines and an elevated plasma metanephrines. Subsequently he proceeded to have adrenalectomy. Pre-operatively the patient was managed with alpha and beta blocking agents for 3 weeks prior to surgery. Post-operative course was uneventful and histopathology confirmed right sided pheochromocytoma. TTE performed 12 months post-operatively showed a significant improvement in his LVEF to 40 % with subsequent TTE showing maintenance of LVEF. This case demonstrates highlights the unusual presentations of pheochromocytomas and that early recognition and early intervention with surgery is the key to recovery to avoid catastrophic cardiac events.1. Chiang YL, Chen PC, Lee CC, et al. Adrenal pheochromocytoma presenting with Takotsubo-pattern cardiomyopathy and acute heart failure: A case report and literature review. *Medicine (Baltimore)*2016;95(36):e4846. doi: 10.1097/MD.0000000000004846 [published Online First: 2016/09/08]

Adipose Tissue, Appetite, and Obesity

ADIPOSE TISSUE BIOLOGY AND OBESITY

Obesity Is Associated With Reduced Expression of the Anorexigenic Neuropeptide Nucleobindin-2/Nesfatin-1 in the Human Nucleus of the Solitary Tract.

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Introduction: Feeding is a complex behavior coordinated by interrelated forebrain, hypothalamic, and brainstem neuronal networks. Brainstem neurons constitute an important input for the neural circuitry integrating nutrient signals to control ingestive behavior. Orexigenic and anorexigenic neuropeptides act in concert to regulate energy balance. Data from animal models suggest that altered neuropeptidergic expression contributes to obesity. Nucleobindin-2/nesfatin-1, an appetite-suppressing neuropeptide and negative regulator of body weight, is reduced in the hypothalamus of mouse obesity models. In obese and overweight humans, we have recently reported decreased nucleobindin-2/nesfatin-1 immunorexpression in the lateral hypothalamic area, which is critically involved in appetite and metabolic regulation and has extensive connections with brainstem feeding circuits. **Objective:** The present study explored nucleobindin-2/nesfatin-1 localization pattern as well as the association between nucleobindin-2/nesfatin-1 protein expression and body weight in human brainstem nuclei. **Methods:** Sections

of 20 human brainstems (13 males, 7 females; 8 normal weight, 6 overweight, 6 obese) were examined by means of immunohistochemistry and double immunofluorescence labeling. **Results:** Nucleobindin-2/nesfatin-1 widespread distribution was observed in various brainstem areas, including nuclei with well-defined roles in energy homeostasis and in autonomic and behavioral processes, such as the nucleus of the solitary tract, dorsal motor nucleus of vagus, area postrema, inferior olive, raphe nuclei, reticular formation, locus coeruleus, parabrachial nuclei, and pontine nuclei, and in Purkinje cells of the cerebellum. Interestingly, nucleobindin-2/nesfatin-1 immunofluorescence signal extensively localized in neuronal subpopulations expressing neuropeptide Y and cocaine- and amphetamine-regulated transcript (peptides known to exert potent actions on food intake and energy balance) in nucleus of the solitary tract, inferior olive, locus coeruleus, and dorsal raphe nucleus. Of note, nucleobindin-2/nesfatin-1 immunorexpression was significantly lower in obese than normal weight subjects in the nucleus of the solitary tract ($p < 0.05$). **Conclusions:** These data provide for the first time neuroanatomical support for the potential role of nucleobindin-2/nesfatin-1 in human brainstem circuits controlling energy homeostasis. In nucleus of the solitary tract, a key integrator of nutrient state signals and a neural substrate of food reward-related processes, altered neurochemistry such as nucleobindin-2/nesfatin-1 deficiency may contribute to dysregulation of homeostatic and/or hedonic feeding behavior and ultimately to obesity.

Pediatric Endocrinology

PEDIATRIC OBESITY, THYROID, AND CANCER

The Effectiveness of Computed Assessment Using GP and TW3 Hybrid System

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Background: Bone age assessments (BAAs) is an important clinical modality to investigate endocrine, genetic and growth disorders in children. It is generally performed by radiological examination of the left hand by using either the Greulich-Pyle (GP) or the Tanner-Whitehouse (TW) method. However, both clinical procedures show several limitations, from significant intra- and inter-operator variability to examination effort of clinicians. To address these problems, several automated approaches have been proposed; nevertheless, some disparity still exists between automated BAAs and manual BAAs to be employed in clinical practice. To overcome this disparity, deep learning-based bone age assess software using GP and TW3 hybrid method has been developed. In this study, we evaluate the accuracy and efficiency of the new automated hybrid